

ZOOLOGY.—*Observations on the morphology and physiology of nemas; including notes on new species.*¹ N. A. COBB, United States Department of Agriculture.

1. A NEW SUBGENUS OF RHABDITIS

There is a group of slender-tailed amphigonid rhabdites having lips and pharynx as shown in Fig. 1, the males of which have weakly developed bursas. Such rhabdites have been described from time to time but no author seems to have had adequate material for a completely satisfactory description. Having examined living specimens of both sexes of a new species of this group I took the occasion to prepare a fuller description of it, and propose it as the type of *Rhabditella*, a new subgenus of the genus *Rhabditis* Dujardin 1845.

Rhabditis (*Rhabditella*) *leptura* n. sp. $\frac{2.5}{1.8}$... $\frac{15}{3.7}$... $\frac{20}{3.4}$... $\frac{10.5}{3.9}$... $\frac{45}{5.9}$... $\frac{71}{2.2}$ 0.82 mm

Thin layers of the transparent, colorless, naked cuticle are traversed by excessively fine, plain, transverse striae, resolvable only with the highest powers. Longitudinal striations, due to the attachment of the musculature, are visible in most regions of the body. No deirids have been observed. The neck is very slightly conoid. The cross section of the pharynx is roundish-triangular; yet the almost imperceptibly sigmoid pharynx is nearly equidiametral throughout, though anteriorly the walls are a trifle more strongly refractive. The glottis is a trifle oblique, but otherwise fairly typical. The oesophagus presents a median, fairly prominent, ellipsoidal swelling, or bulb, two-thirds as wide as the middle of the neck, and a somewhat ellipsoidal, or obscurely pyriform posterior bulb two-thirds as wide as the base of the neck,—both swellings of approximately the same diameter. The median swelling presents an elongated, obscure but rather large, valvular apparatus, while the cardiac bulb presents a rather strongly refractive, somewhat three-fold, striated valvular apparatus, located a little in front of the middle of the bulb. At the nerve-ring the oesophagus is one-third, and in front of the cardiac bulb about one-fourth as wide as the corresponding portion of the neck. There is a distinct cardiac collum constituting a rather broad constriction, so that the anterior portion of the intestine through a distance nearly equal to one body-width enlarges from about one-third to five-sixths as wide as the body. This appearance, however, is somewhat variable. The nerve-ring surrounds the oesophagus obliquely. The intestine, the lining of which is somewhat refractive, is made up of cells of such size that probably only about two are presented in each cross section; these cells contain granules of variable size, which are not strongly birefringent. With crossed nicols there is no suggestion of a St. Andrew's cross;—not at all like the strong birefringence of *R. monohystera*. The posterior lip of the anus is very slightly raised. The rectum, whose lining is only slightly refractive, is one and one-



Fig. 1. Front and dorsal view of the head of *Rhabditella leptura*. The beginning of the oesophagus is shown in the lower illustration.

third times as long as the anal body diameter. The vulva is slightly depressed, though its lips are slightly elevated. The ovaries extend two-thirds the distance back to the vulva, and are only about one-sixth as wide as the body of the female. The smooth, thin-shelled, ellipsoidal eggs, about as long as the body is wide and two-thirds as wide as long, have been seen in the uteri one at a time. Their yolk is made up of closely packed, faintly refractive, spherical granules, scattered among which are a few exceedingly small granules less than one micron in diameter.

$\frac{2.3}{2.1} \dots \frac{16}{3.8} \dots \frac{24}{4} \dots \frac{44}{4.2} \dots \frac{75}{5.1} \dots 0.61 \text{ mm}$ There are two, equal, separate spicula. The nema must be tipped a little in order to bring the slightly developed obscure bursa into profile view. The foremost papilla, or bursal rib, is somewhat variable in position and is sometimes found nearly as far forward as the proximal ends of the spicula. Fig. 2.

The testis is reflexed at its free end for a distance equal to about two body diameters. This portion of the testis is only about one-fourth as wide as the body, though it is very slightly swollen at its extremity. Behind the flexure for some little distance the testis still remains narrow,—only a little wider than the reflexed portion lying alongside. Then, however, it rather suddenly enlarges and soon becomes half as wide as the body and so continues, enlarging slightly, however, for three or four body widths. In this portion of the testis the spermatocytes pass through their growth period; they appear as if in two rows and in pairs side by side, and one gets the impression that these pairs are twin cells. Their nuclei are large, becoming at last half as wide as the elongated spermatocytes themselves, i.e. one-fifth as wide as the nema. About halfway from the blind end of the testis to the anus the full grown spermatocytes, here half as wide as the body and about as long as wide, apparently break successively into quartets, the resulting subspherical cells being a little more than one-fourth as wide as the body. For a distance equal to about two body diameters forward from the spicula the sexual organ is narrower,—about one-third as wide as the body. Whether the cells of the quartet divide further remains unknown.

Examination of one of the members of a quartet indicated the probable presence of about seven chromosomes.

Habitat: Decaying fruit of *Iuffa acutangula* from Tela, Honduras, October, 1926. Sent by Horace S. Dean.

Diagnosis: *Rhabditella* subg. nov. *Rhabdites* having lips and pharynx as shown in Fig. 1, the males of which have a weakly developed costate bursa and long slender tails.

Diagnosis: *Rhabditis* (*Rhabditella*) *leptura* n. sp. *Rhabditella*s dimensioned as shown in the formulae; male with two separate spicula, a simple inconspicuous gubernaculum, and with nine bursal ribs arranged as shown in Fig. 2; phasmids present.

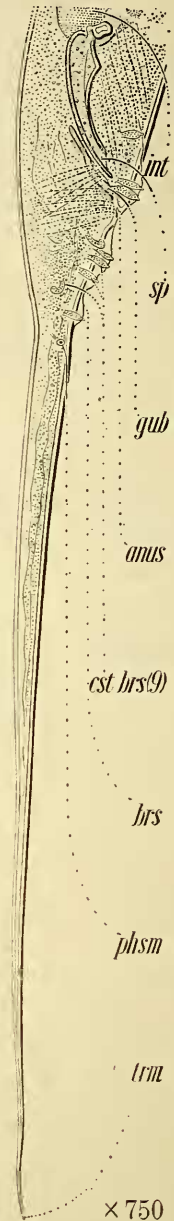


Fig. 2. Tail of male of *Rhabditella leptura* n. sp.

2. MYOLABIA ON A NEMIC PARASITE OF MILLIPEDS

The front view of the lip region of *Thelastoma attenuatum* Leidy, a nema from the intestine of the milliped *Sporobolus marginatus*, gives the impression at first that there is a circle of 10 "lobes" surrounding the usual three lips. Careful scrutiny shows that two of these ten lobes, the lateral ones, are the external amphids. This leaves 8 other lobes arranged in 4 submedian pairs.

A similar condition exists on another, and new, species of *Thelastoma* occurring in the same host, except that in this new nema the amphidial lobes do not so closely resemble the other 8. Fig. 3. In the new species the first slice behind the lip region discloses the anterior parts of 8 muscular fields that extend throughout the body, as may be shown by cross sectioning. Fig. 3. Furthermore, it is quite evident that the 8 labial "lobes" are the external cephalic expression of these 8 longitudinal muscular fields.

It is therefore very interesting to find that in a second new species of *Thelastoma*, belonging to a new subgenus and infesting a different host (namely the milliped *Fontaria marginata* Say, as found in Virginia, U. S. A., near the District of Columbia) the 8 organs which in *Thelastoma attenuatum* are rather inconspicuous lobes surrounding the true lips, have entirely displaced the ordinary lips, forming a lip region prominently set off by constriction, and consisting of 8 prominent subequal contiguous parts folded completely together over the pharynx and constituting lips of a new sort. Figs. 4 & 5. This *Fontaria* parasite presents, in cross-section, 8 pairs of muscular fields. Fig. 5.

These lips may be called *pseudolabia*;—or, because of their connection with the longitudinal muscular fields of the nema, *myolabia*. No cephalic papillae have as yet been seen on these myolabia.

Diagnosis. *Thelastoma (Thelastoma) spicatum* n. sp. Much like *T. attenuatum* Leidy, but smaller and with shorter spicate tail and more completely differentiated, though still rather vague, myolabia. Dimensioned as shown in the formula. Fig. 3. *Attenuatum* and *spicatum* may occur together in the intestine of the milliped, *Sporobolus marginatus*.

Diagnosis. *Thelastomellum* subg. nov. *Thelastomas* with 8 well-developed myolabia as in Fig. 5. Type species *T. myolabiatum* n. sp.

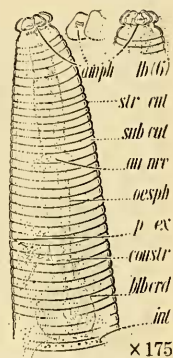


Fig. 4. Profile of head and neck of *Thelastoma (Thelastomellum) myolabiatum*.

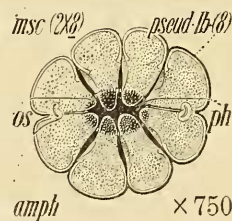
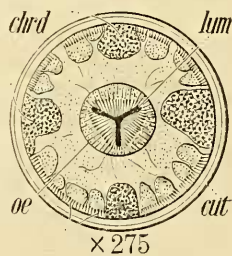
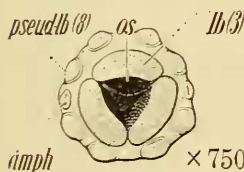
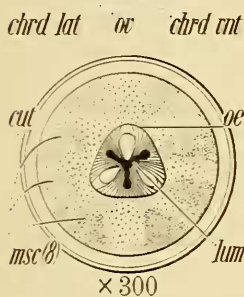


Fig. 5. Measurements, front view and cervical cross-section of *Thelastoma (Thelastomellum) subg. nov. L. myolabiatum*.



0.5	8.	18.	25.48	20	78.	28mm
1.5	4.	7.5	9.4	46		

Fig. 3. Measurements, front view of the lip region and nearby cross-sections of *Thelastoma (Thelastoma) spicatum* n. sp.

Fig. 5. Measurements, front view and cervical cross-section of *Thelastoma (Thelastomellum) subg. nov. L. myolabiatum*.

Diagnosis. *Thelastoma* (*Thelastomellum*) *myolabiatum* n. sp. Dimensioned as shown in the formula, and with lips and amphids as in Fig. 5.

3. SYNGONY IN A NEW NEMA FOUND IN MILLIPEDS

Hitherto undescribed nemtic parasites found in the intestine of the milliped *Fontaria marginata* Say and belonging to the genus *Thelastoma* Leidy, prove syngonic. *Thelastoma* would be assigned by most authors to the group Oxyuridae.

The discovery of syngony in this group opens up an interesting field for speculation and research. It has long been felt that the "Oxyuridae" present many resemblances to the rhabdites. The gonism of the rhabdites has been found very varied, particularly through the researches of Maupas. Query: To what extent, now, will the variations exhibited by the rhabdites be found to occur in the "Oxyuridae?"

Male "oxyurids" usually are less common than the corresponding females, quite frequently are rare, and in some cases are unknown. The striking nature of the recorded sex ratios has been explained by saying that the males, being very much smaller, are easily overlooked, and that possibly they die soon after copulation; and that these two factors,—their smallness and (assumed) relatively early death,—account for their supposed rarity.

In the rhabdites the evidence fully warrants the view that syngony has evolved from amphigony with a gradual diminution or disappearance of males;—for many stages between the two extremes still exist as evidence of the possibility of such a change. Therefore the discovery of syngony in the "oxyurids" at once suggests a new explanation of the scarcity of "oxyurid" males, namely, the one now usually accepted in many cases for the rarity of male rhabdites. If this be true of the "oxyurids," it may have a considerable bearing on veterinary and medical questions connected with "oxyurid" parasites in man and domesticated animals, and in other hosts.

Species that have been assigned to the "Oxyuridae" are common parasites of insects and some other annulata.

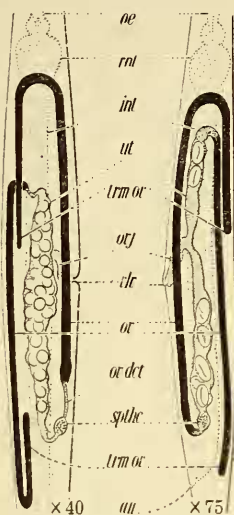


Fig. 6. Slightly diagrammatic drawings of the female gonads of *Thelastoma* (left) and *Thelastomellum* (right). *sp. the.* spermatheca.



Fig. 7. Scoop shaped syngonic sperms of *Thelastomellum*.